

WHAT IS CLAIMED IS:

1. A multilayer brush composed chiefly of copper and graphite and incorporated therein with a solid  
5 lubricant, which brush consists essentially of two types of brushes, a high-copper-content part brush containing the copper in a large quantity and a low-copper-content part brush containing the copper in a small quantity, wherein;  
10 at least the high-copper-content part brush contains zinc in an amount of from 0.1% by weight to 5% by weight, and the zinc and the copper form an alloy.
2. The multilayer brush according to claim 1,  
15 wherein the low-copper-content part brush further contains zinc in an amount of from 0.1% by weight to 3% by weight, and the zinc and the copper form an alloy.
3. The multilayer brush according to claim 2,  
20 wherein the high-copper-content part brush further contains at least one of manganese and nickel in an amount of from 0.1% by weight to 3% by weight.
4. The multilayer brush according to claim 3,  
25 wherein the low-copper-content part brush further contains at least one of manganese and nickel in an

amount of from 0.1% by weight to 3% by weight.

5. The multilayer brush according to claim 1, wherein the high-copper-content part brush contains the  
5 copper in an amount of from 30% by weight to 80% by weight and the low-copper-content part brush contains the copper in an amount of from 10% by weight to less than 45% by weight.

10 6. A multilayer brush composed chiefly of copper and graphite and incorporated therein with a solid lubricant, which consists essentially of two types of brushes, a high-copper-content part brush containing the copper in a large quantity and a low-copper-content  
15 part brush containing the copper in a small quantity, wherein;

the multilayer brush has values falling under any of voltage drop of from 0.30 to 0.65 (V), voltage drop change value of from 0.01 to 0.15 (V) and  
20 commutator wear of from 8 to 190 ( $\mu\text{m}$ ) when, in a high-current cycle test on the multilayer brush, a tester having a copper ring of 80 mm in diameter is used, the test is made in repeated operation at a current density of 140 A/cm<sup>2</sup>, a brush pressing force of  
25 7 N and a number of revolutions of from 0 to 7,000 min<sup>-1</sup>, the difference in voltage between each multilayer brush

and the copper ring is measured to regard the measured value as the voltage drop, and the value of change of the initial-stage value after a 6-hour test is regarded as the change value of voltage drop, and when, in an  
5 actual-use durability test on starting motors for automobiles, a 1.4 kW starting motor is fitted to a 1.8 liter gasoline engine, the motor is driven over 10,000 cycles (repetition of ON for 2 seconds and OFF for 28 seconds), and the commutator wear is calculated from a  
10 difference in wear between the wear before a brush lifetime test and that after the same.